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PAPERS

IN

A G R I C U L T U R E.

The GOLD MEDAL of the Society, the Premium offered in Class 5, was this Session adjudged to her Grace the Duchess of RUTLAND, of Belvoir Castle, for raising Oaks. The following Communications on the Subject were received from Mr. MATTHEW POUND, her Grace's Woodman.

SIR,

ON behalf of her Grace the Duchess of Rutland, as a candidate for a premium for ascertaining the best method of raising oaks, agreeably to the rules of the Society of Arts, &c., premium No. 5, for the Year, 1815, I am directed by her Grace to communicate to the Society the following comparative experiments on the best method of raising oaks, and which have been adopted in the nurseries and land set apart for the purpose, under her immediate inspection.

D

No. I.

No. I.

In respect to the best method of raising and growing oaks for timber, the following offers itself, and which has been successfully tried on her Grace's land. Previous to sowing the acorn the land was pared and burnt, and buck-wheat sown the first year: the second year (1807) the acorns were sown in drills, three feet apart, after the land had been once ploughed; the rows were hoed the two first years: the third, fourth and fifth years potatoes were planted between the rows, one row only between each row of oaks: the second, third and fourth years the trees were thinned to two feet apart in the rows; the third crop of potatoes being one year after the last thinning. The next year being the sixth year after sowing the acorns, the potatoe-crop ceased, as the branches had formed too much shade: had not this been the case, the potatoe-crop would have been continued, as the principal object in view is to keep up a continual *smothering crop*, until the oaks become *such* themselves: after that period, there is nothing to impede a most rapid growth, forming straight, clean, handsome bolls; and, by proper attention to thinning at certain periods, soon become a valuable plantation of superior oaks:—These oaks having been sown only eight years, many of them are *eleven* feet high, and *ten* inches in circumference; and so fine and clean in their growth, that every judge who sees them is surprised at their progress; and this is certainly owing to the method pursued,

No. II.

The second comparative experiment was made on *grass land*. The land was ploughed *once*, and the acorns sown in drills, *five feet apart*, and hoed the two first years; after this

this period, there was nothing more done than to cut down the tall weeds with a reaping-hook once in each year, for four years; these trees were thinned to three feet apart in the rows, after the second, third and fourth years of their growth: these trees were sown in 1808, and are now six feet high, of a healthy, strong appearance, but not so fine as No. 1. by a very great difference, and are not likely to advance so rapidly.

No. III.

The third comparative experiment was by planting; the land was previously ploughed and sown with buck wheat. The land being clean, no weeds had arisen through the winter; this piece of land was about seven acres, and it was desirable to plant the whole with oaks, having a quantity of two and three years seedling oaks, both in nursery beds and in drills, I was induced, through the lateness of the season and scarcity of hands, to plant these oaks *with the plough*; this so far succeeded, that in six days I had planted about half the land with about 100,000 oaks in rows, at three feet distance, and one foot plant from plant. My object in planting one foot plant from plant was to grow them from two or three years, then to thin them to three feet, which has been done; they now stand three feet apart, or thereabouts; these trees were hoed the two first summers, since which nothing has been done but thinning them to three feet, and cutting down the tall weeds once in the year for the four years after; this is now a very healthy thriving plantation, and has every appearance of making a good oak wood, the plants being on an average four feet high.

No. IV.

The fourth comparative experiment was made on the remaining half of the abovementioned seven acres, and planted in every respect the same way, with only this difference, namely, the acorns were sown in the year 1808 in the nursery, in beds, the common way. From the bad opinion I had of raising oaks in nursery beds, and then quartering them out for two, three, or four years, previous to making them into a plantation, induced me to try this method, which has fully answered my expectation. These oaks on an average are three feet high, and perfectly healthy ; they will, no doubt, make a good oak wood. Their not being higher than three feet must be attributed to their having been raised in nursery beds, which rendered them, *when planted*, more weak and delicate than those raised *in drills*. So fully convinced am I of this, that I now sow all in drills.

No. V.

In the fifth comparative experiment, two acres were planted with oaks *only*, at four feet distance each way ; this was done by digging holes, and planting the seedling plants at three years old, one plant in each hole ; these plants were the thinnings of No. 1. The land was allowed to be planted by poor persons with potatoes, one row *only* between each row of oaks ; this practice has been followed for three years, and the oaks have so increased in their growth as almost to exclude the air from the potatoes, and will next year become compleat *smothering* crop : This desirable circumstance has been effected with *oaks only*, without a mixture of any other trees, in four years ; and, there is no doubt, that the plants will advance

vance at a most rapid rate, many of this year's shoots being two feet long, and the plants in general seven feet high.

From the observations I have been able to make from the above experiments, I consider the *first* and the *last methods* as the best : the first method, No. 1., is by sowing the acorns where they are to remain, and after hoeing the rows two years, to plant potatoes, one row only between each row of oaks, for three years ; decidedly in my opinion the *best method*, as the facts themselves will prove. The benefit of the oaks from planting potatoes is incalculable ; for, from the above experiments, and from others made at the same time, and with the same seedling oaks, planted with a mixture of larch, spruce, beech, birch, and other forest trees, and also with oaks only. In all cases, I have found that potatoes between the rows are so superior to all other methods, that the oaks will actually grow as much the first four years with them, as in six without them.

It appears, then, that the great secret in raising plantations of oaks is, to get them to advance rapidly the first eight years from seed, or the first five years from planting, so as the heads of the trees are compleatly united and become a *smothering crop* : after this is effected, the trees will strive to outgrow each other, and will advance in height rapidly ; they will be clean straight trees to any given height : experiments have proved the fact, which may be verified by viewing Belvoir.

How easy is it then to have fine plantations for oaks *only*, without mixture, as the *smothering crop* can be produced the third year after sowing the acorns, and the first year after planting, by the *potatoe crop*, until the oaks themselves become a smothering crop. If the seedlings are carefully thinned, and as carefully planted, all doubts of obtaining a

fine plantation of oaks are at an end. By the method of planting I have described, I have found that not more, on an average, than one in five hundred die.

I beg leave to state particularly to the Society, that the foregoing experiments of growing oaks only, without a mixture of other forest trees, were made with a view to controvert the opinion generally, I believe, entertained, that a good oak plantation could not be raised or obtained without a mixture of firs or other trees to shelter or protect them in their infant state, as it appeared evident to me, from the plantations around Belvoir, that the oaks were uniformly *worse* in the mixed plantations, than in those of *oak only*. Oaks, in my opinion, are much injured by any, or all sorts of trees growing near them, and therefore are not *ultimately* promoted in their growth by being planted in mixed plantations.

The annexed Certificate, signed by experienced and respectable nurserymen and gardeners, who have viewed the whole of the plantations mentioned in my communication, will shew the condition they are in, and that what is stated is correct.

Any further explanation which may be deemed necessary will be readily furnished, by addressing a line to me, nurseryman, Belvoir Castle, near Grantham, Lincolnshire.

I am, Sir,

Your most obedient Servant,

MATTHEW POUND.

Belvoir Castle, 23d Nov. 1815.

To C. TAYLOR, M. D. SEC.

CERTIFICATE.

CERTIFICATE.

WE, the undersigned, having viewed the plantations referred to in the preceding report, do hereby certify, that they are healthy in every respect as stated; particularly No. 1., in which the trees are very fine, clean, and large, much larger than any we have seen of their age; and, it is our opinion, that this has been effected by the treatment pursued, which appears to us to be the best method of raising oak timber: the whole are well fenced with posts, and rails, and young hawthorn hedges, planted the common way with ditches.

(Signed) The REV. SIR JOHN THOROTON.
WILLIAM WOOD, Nurseryman, Gran-
tham.
WILLIAM WOOD, Jun. Do. Do.
WILLIAM DOLBY, Gardener to SIR
W. E. WELBY, Bart. Denton.

In consequence of the foregoing statement, the Secretary was ordered to apply to Mr. POUND for further particulars, describing the quantity of ground in each experiment, and the probable expence of cultivation; in reply to which the following Communication was received.

SIR,

I RECEIVED your letter on the seventh of March, respecting some further explanation upon the subject of a claim on behalf of her Grace the DUCHESS OF RUTLAND, "ascertaining the best method of raising oaks for timber," (see the List of the Society's Premiums, Article V.) I beg leave, in addition to my former report, to transmit the following particulars.

No. I.

This land is situated rather low, and in the ancient Belvoir Chase, in that part set out for woodlands by the Commissioners of the late enclosure. The land, from the number of oaks, shoots, or roots, remaining after cutting large oak timber for centuries past, and the quantity of fine oak timber now standing, gives an original appearance to this place, presenting the rough surface it has possessed for centuries; being "*such land as is not calculated for the purposes of husbandry!*"

The method pursued to reduce this land for sowing acorns, was to pare it as well as the roots would permit, and burn the surface. The ashes, which were a plentiful dressing, were spread on the surface, and ploughed as well as the nature of such rooty ground would allow; that part, which could not be ploughed round the large roots, was spiltled over with the spade, and sown with buck-wheat; the crop alone was sufficient to pay the expences hitherto incurred. Being prepared by the previous crop of buck-wheat, the land was ploughed and spiltled with the spade as before, finding it impracticable to drill it with the plough. The hoe and line were introduced, and drills made at three feet distance. The acorns were sown in the year 1807. The two following years the ground was hoed twice each summer; the third and fourth years, the oaks were thinned to two feet distance in the rows. Potatoes were planted the third, fourth and fifth years, one row only, between the rows of oaks; since which nothing has been done except cutting the long weeds with a reaping-hook once in the summer for two years more.

This

This piece of land contains one and a-half acres, and the qualities of the soil I will immediately describe.

The surface, a strong hazel loam approaching to clay, from twelve to eighteen inches deep.

The substratum, altering as it deepens, to a grey clay, and from that to a blue, at the depth of six feet. After this, strong blue clay, to a great depth.

Expence of the above Mode per Acre.

	£. s. d.
Ploughing per acre once	0 12 0
Digging round the roots	0 5 0
Drilling the acorns with hoe and line	0 10 0
Hoeing the land two years, twice each summer, at 5s.	1 0 0
Cutting the weeds after the potatoe crop had ceased, two years at 2s. 6d.	0 5 0
	<hr/>
	£2 12 0
Deduct rent for planting potatoes, three years, at 4s. per acre	0 12 0
	<hr/>
Total expence per acre	£2 0 0

No. II.

The situation and soil of this piece of land are similar to No. 1; to which I beg leave to refer. The land contains about two acres, which being ploughed, the acorns were sown in drills, at five feet distance. The two following years it was hoed twice each summer, and for the ensuing four years, the tall weeds were cut once each summer; since which nothing more has been done.

Expence

AGRICULTURE.

	<i>Expence per Acre.</i>	<i>£. s. d.</i>
Ploughing at 12s. per acre	- - -	0 12 0
Drilling with hoe and line	- - -	0 10 0
Hoeing two years, twice each summer, at 5s. each time	- - - - -	1 0 0
Cutting weeds 4 years, at 2s. 6d. per summer	0 10 0	
Total expence per acre	- -	<hr/> £2 12 0

The thinning of the above seedling oaks is not charged in this account, as I have invariably charged the new plantations with the taking up the young trees.

No. III.

This land was prepared by a previous crop of buck-wheat, and being clear of weeds, the oaks were planted with the plough at intervals of three feet, or as near that distance as possible with the plough, having opened four ridges or lands, laying the two first bouts back to back, making four furrows of nine inches each, which form the two first rows. Six men and six boys, stationed at proper distances, proceed to plant the oaks; the man with a broad spade strikes it into the side of the furrow last thrown up, with one side in the open furrow obliquely, and the other in the earth thrown up. The moment the spade is chopped in, the boy inserts the plant in the opening, with the top root extending into the bottom of the furrow. As the man proceeds every chop he makes, his foot next the plants closes a former opening, and closes the earth to the plant. During this operation the plough is making other furrows on another land, to be ready for the planters, thus continuing until the work is ended. The two
first

first summers the land was hoed twice in each; the third, fourth, fifth, and sixth, the long weeds were cut once in each. The plants were raised in drills, and were the thinnings of No. 2. They are fine and healthy.

This piece of land contains the half of seven acres, and is situate on rising ground.

The Qualities of the Soil.

The surface red, rather light, mixed with a soft red earthy stone, generally small, many of which may be crushed with the foot, from eight to eighteen inches deep.

The substratum consists of the same red earth, mixed with large loose stones, being one half stone to the depth of six feet. Afterwards an inferior iron-stone, composed of loose rock, from four to six feet in thickness. At the depth of twelve feet, a white marley clay to a great depth.

Expence per Acre.

	£.	s.	d.
Ploughing per Acre, at 12s.	-	0	12 0
Six men, at 2s.—Six boys, at 1s.	-	0	18 0
Hoeing twice, two years, at 5s. each	1	0	0
Cutting weeds 4 years, at 2s. 6d.	-	0	10 0
One man taking up oak from No. 2	0	2	6
			<hr/>
Total expence per acre	<hr/>	<hr/>	<hr/>
	£3	2	6

No. IV.

The other part of this same field, containing the half of the before-mentioned seven acres, was planted with the plough similar to No. 3, with plants taken from nursery beds. The object was to ascertain the best method of raising

raising oaks, either by drills or nursery beds, and afterwards transplanting. These seven acres being set apart for planting, and divided half to No. 3, the other half to No. 4, and treated in all respects like the former. Accordingly, the surface, substratum, and other particulars agreeing with No. 3, to which I beg leave to refer. From observations on the above, I am fully convinced, that sowing oak in drills is a better method than sowing them in beds, in which they contract a weakness which must take some years to recover to a state of perfect health and strength.

No. V.

Is situate rather low, and has such an uneven surface, that no attempt apparently has ever been made to bring the lands into tillage, being found in its original state, and according to the rules of the society, "*are such lands as are not calculated for the purposes of husbandry.*" These lands are part of a plantation of twenty-six acres, twenty-four acres being planted as a mixed plantation, and the two acres as a specimen of oaks *only*,—a living evidence of the best method of growing oak timber; the circumstances of soil and situation being similar.

The very uneven surface of this land made it impracticable for ploughing, therefore it was determined to plant it, by digging holes in the common way; when done, the ground was immediately let to labourers at 4s. per acre, for planting potatoes. The object to be obtained in letting the land so low, was, to induce the labouring poor to plant the whole with potatoes, which I set out in lots of a rood each for that purpose. This has succeeded to my wishes, and the result has fully answered.

The trees were planted at four feet distance each way, in

an irregular diagonal direction, the potatoes being planted one row only between the rows of trees,—an incalculable advantage to their growth, as the distance admits of the potatoes growing strong, and falling down on each side of the rows, forming a fit shade and shelter for the roots of the young trees. Thus situated, a quick growth ensues, and it may be reckoned that oaks, so treated, will grow a foot the first year. The smothering crop is produced the first year, and the growth of the trees established. By following up the potatoe planting for three years longer, the heads of the trees begin to unite, when all doubt respecting a fine plantation is at an end.

In the above experiments to ascertain the best method of growing oaks for timber, it is my opinion that No. 1 is the best method for sowing acorns, and No. 5 for transplanting, to obtain, in the shortest time, a fine plantation of oak timber.

Qualities of the Soil.

The surface a strong hazel loam, with a small quantity of sand, and approaching to clay from six to eighteen inches deep.

The substratum, altering to a grey, and from that to a blue clay, at the depth of four feet; below, a great depth of blue clay.

<i>Expence per Acre.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
Digging 2720 holes, at 4d. per score	-	2	5 4
Planting by the day, or at 5d. per score, which is nearly equal in expence	-	2	16 8
	<hr/>	<hr/>	<hr/>
	£	5	2 0
Deduct four years rent at 4s. per acre	-	0	16 0
Total expence per acre	-	-	£4 6 0
			The

The plantations, at former periods, at Belvoir, were of the best quality, and illustrate the principle of forming plantations designed for oak timber, with oaks only. The plantations near Belvoir Castle, two of which appear to have been planted from 130 to 140 years since, one with a variety of oaks, elm, ash, horse and Spanish chesnut, lime, alder, silver fir, Scotch ditto, holly and yew, were in a rich deep soil. It is certainly desirable to know the result of such a plantation, where such variety of useful timber has been planted. The elm and ash have compleatly obtained the ascendancy, to the great injury of the oaks, and other varieties of forest trees.

The elm and ash form one of the finest plantations in the kingdom. The trees are of large straight bolls, from thirty to sixty feet in height, and from twelve inches to two feet the girth.

The other plantation of this date is of oaks only, which are remarkably fine: they have long straight handsome bolls, from thirty to fifty feet, and from ten to sixteen inches girth. The plantation is one of the finest for oak timber in the kingdom, the wood being of the best quality. The soil and situation of both are similar.

There are two other plantations, which appear to be about one hundred years old, and which are exactly in the same predicament. Where there are oaks only, they are very fine clean timber; on the contrary, where ash and Scotch firs are mixed, the oaks are good for little, and irrecoverable.

Other plantations have been made about forty years since, among which, there is one of oaks only, containing about one hundred acres, which was many years compleating, the whole being sown with acorns. On that part which has been longest finished, the trees are very fine and straight; indeed the whole of them are in a flourishing state.

Plantations

Plantations have been made here to a great extent, within the last twenty-five years, of every description ; of the particulars of these plantations I cannot correctly speak, but habitually knowing their situation, I am led to think that there cannot be less than eight hundred acres, well planted, and in a flourishing condition.

I beg leave particularly to observe to the Society, that the plantations made by her Grace within the last sixteen years, generally on land not calculated for the purposes of husbandry, are numerous, in various situations and great variety of soil, principally in the above-mentioned species of red earth, having a loose inferior iron-stone rock, to the depth of twelve feet ; others are situated on hazel loam, approaching to clay, from six to eighteen inches deep, altering after that to a blue clay, at the depth of six feet. Some of the plantations are situated on strong adhesive clay, not calculated for any purpose of husbandry. Her Grace has also planted on bogs of the worst description, many of which have been so full of water, that by treading on the ground suddenly, it would shake for twenty yards together. These have been laid dry effectually, by a method of draining with black thorns, agreeably to her Grace's directions, and are now fine flourishing plantations. They are composed of varieties of forest trees, viz. oak, elm, beech, hornbeam, sycamore, lime, Spanish chesnut, horse chesnut, birch, alder, walnut, larch, silver fir, Balm of Gilead fir, Weymouth pine, Scotch and spruce fir, which varieties are mixed and planted in such soils and situations as are most suitable for their growth ; and on such other soils as are best adapted for the purpose, the plantations are composed of half oaks, and filled up with other mixtures. Her Grace's various plantations, made by her particular directions, contain upwards of one hundred and

and ninety acres, and bear the above variety of trees, to the amount of 768,211; all of which are in a fine healthy flourishing state.

Having gone through my observations on the plantations at Belvoir, it will be obvious to the Society, that the several plantations made by her Grace are in a very flourishing state, and are likely to become, at no very distant period, a valuable acquisition to the country.

(Signed) MATTHEW POUND, *Woodman.*
REV. SIR JOHN THOROTON.

To C. TAYLOR, M. D. SEC.

The GOLD MEDAL, the Premium offered in Class 62, was this Session adjudged to JOHN CHRISTIAN CURWEN, Esq. V. P. M P. of Workington Hall, Cumberland, for Feeding of Cattle. The following Communications on the Subject were received from him.

MY DEAR SIR,

UNDER the fostering influence of the Society of Arts, &c, great has been the advantage reaped by the empire in every useful branch of knowledge. The hope of their honours has, and I trust will to the latest period, form a powerful stimulus to exertion. I speak feelingly:—Many of my experiments would otherwise have never been undertaken. My sense of gratitude for their favours, is not, I trust, the only effect produced. The sanction of their patronage on the system of soiling has had an extensive influence in spreading the practice

practice through every part of this country. The favourable light in which it is held encouraged me to attempt extending the practice still further, and suggested the trying to rear cattle by the same means.

The objects to be gained were a more early maturity, a diminished risk in rearing, a saving in cost in feeding, and the creation of an additional quantity of manure. The farmer and public were likely to be benefited, and the experiment was successful.

The result which I have now the honour of submitting to the Society, will, I hope, prove satisfactory to them, and conclusive as to the success which has attended the experiment in every point.

Seventeen calves were reared in the course of the last year: eleven short-horned, or Durham breed; six Ayrshire. Of those turned into the yard, which is done when they are two months old, not one has been lost, nor have they been subject to any complaint. Attention was particularly paid to them at the period of changing their food from turnips to clover. The intention of the experiment being to bottom the practice on a system which might afford a prospect of profit to the farmer, all costly food was rejected. The first month the calves had but one gallon of new milk per day; for three months afterwards three gallons *. A winter dairy being what is aimed at, most of the calves are dropped from November till April. Turnips and hay were given with the milk, but neither cake or meal. From June till October the food was clover; afterwards, till the end of May, turnips; till Christmas they had some little

* The twenty-five calves of this year had 7072 gallons two quarts of new milk.

hay, *being well taken to the turnip*, straw was substituted.

In size they were little inferior to those of double their age. So good was their condition, that one of the Ayrshire heifers, of eighteen months, was butchered. The live weight was fifty-five stone, of fourteen pounds to the stone. The carcass was thirty-one stone nine pounds, and the loose fat two stone nine pounds. The animal was weighed without fasting, which was equal to a tenth of its weight. The carcass was esteemed particularly beautiful, and the meat highly approved of by the Members who saw it, (for it was killed at the meeting of the Workington Society). Not one of the numerous visitors who was not agreeably disappointed as to the result. The short-horned, or Durham breed, were in much greater condition, and would have killed six-and-forty stone at least. The gain on turnips was fully three pounds a day on each of the Durham heifers. I conceive there would be no difficulty in bringing up the heifers to sixty stone of carcass at two years old. They consumed on an average six stone of turnips a day; of hay they had about half a stone; when straw was given no account was taken. Besides the food I have just mentioned, they had a feed of steamed chaff; the benefit of which was solely from its warmth, in preventing the green food disagreeing with them, as it would otherwise have been cast into the dung-hill.

The produce of two acres, divided between turnip and clover, would be abundantly sufficient to support a beast to two years old. The comparison between animal and vegetable food would be thus:—A fallowed acre of wheat may be supposed to produce thirty Winchesters of sixty pounds weight, or 1800 pounds; sixty stone of carcass would be

840, taking the loose fat at five stone; seventy pounds total at 980 pounds; so that the animal food, on this system, would be equal to one half of the vegetable, where fallow is introduced, under any other system, nearly equal to a third.

The manure created was very considerable. As this depends on the quantity of straw, it is difficult to say to what extent it might be carried. In soiling in the house, the calculation is a ton a month for each beast, and not much less might be made by this mode, though not of equal quality. In the present year I have reared five-and-twenty calves with equal success. The progress is always greater on turnip than clover. The heifers of twenty months are now taken into the house, and will, as occasion offers, be given the bull. In size and figure they are of great promise. The success of the experiment has both pleased and surprized all who have seen them: nor has the example been without its effect; some of the farmers in the neighbourhood have already adopted the practice. Gratified shall I be if this meets with the approbation of the Society, and shall be happy to render any further information that may be required, trusting this new system of soiling may be as favourably received as what I formerly submitted to them. I had then no other claim to meet than that of adopting a practice prevalent in the Netherlands. At present I am a candidate for originating a system not previously known.

I beg leave to subjoin an account of the mode of burning surface soil and clay, by the use of hot lime. This practice, which bids fair to be attended with important consequences, has long been in use in Ireland. On the bogs I observed it (in a recent tour through that country) with great satis-

faction, and lost no time in adopting it. The first attempt was the burning it in kilns with roots and blocks of wood. The cost was considerable, which led to the attempting it with hot lime; seventy Winchesters of lime, directly from the kiln, spread on a layer of sods, eight yards in length and five in breadth, between some layers of sods of a foot each, will, in twenty-four hours, ignite it. Fresh sods must then be applied, and when a quantity of ashes are once procured, a proportion of clay may be burnt with it; by this mode the fire is never so hot as to vitrify the ashes. The fructifying quality depending, probably, on the union with the atmosphere, the ashes will benefit in proportion to their power of absorption. I have Swedes, with sixty single-horse carts of ashes, little inferior to those that had one hundred of dung; common turnips, from forty carts, that are forty tons per acre, and this on strong clay, not deemed fit for turnip culture. I have twenty-one acres, with only twenty cart load, that are highly promising; these are on new ground. Sixty acres of wheat, from forty carts of ashes and sixty Winchesters of lime; this was but a light crop. The soil being a clay, and the elevation great, I am disposed to attribute the lightness of the crop to its being sown too late in the season. The clover is admirable, and such as was never seen on this farm. By this power of creating manure, a much larger proportion of dung may be given to clay ground; the benefit of which, I am disposed to believe, will most amply compensate. I hope, at some future period, to be able to bring this subject before the Society. My potatoes have been housed some days, and wheat sown. Another week of good weather will see sixty acres of turnips stacked, and wheat sown. By this practice, and more early sowing,

sowing, many of the objections to growing turnips on dry soils are obviated.

I have the honour to be,

With much respect and esteem,
Your obliged Friend,

J. C. CURWEN.

Workington Hall, Oct. 15, 1815.

To C. TAYLOR, M. D. SEC.

MY DEAR SIR,

LAST night I sent you a paper on rearing cattle by soiling. Knowing your tried friendship, I have less to fear and every thing to hope in rectifying a blunder I have committed on the comparative produce of vegetable and animal food. An acre of fallowed wheat produces 128 stone eight pounds, of thirty Winchesters of sixty pounds. I fear I have stated this as only ninety ; the produce in animal food sixty-five, being one half. May I beg you to alter it, or otherwise to return it for correction. I do not know how I got wrong on this point ; I am glad however to have detected it. I consider this as the most important object I have accomplished in farming, and one likely to be very speedily adopted. I preferred the honours of the Arts and Sciences to those of the Board of Agriculture. Our season here has been favourable, and the crop admirable. The prices are frightful, and if they do not mend, the farmer will be certainly ruined.

I am, Dear Sir,

Your obliged Friend,

J. C. CURWEN.

Workington Hall, Oct. 16, 1816.

To C. TAYLOR, M. D. SEC.

E 3

SIR,

SIR,

IN reply to the letter which you did me the honour to address to me, of the 30th ult. relative to my friend Mr. CURWEN's mode of rearing stock, I have only to say, that I have now been in the habit of examining their general state and condition annually for years past, and have universally found that no cattle in the country have ever been in any thing like their order, either in point of fatness or healthfulness. It was, however, only last year that we had an opportunity of witnessing the effect of his system of winter feeding on steamed food, as practised upon *young cattle*, and though their *progress* and *condition* certainly *surpassed any thing I had ever before observed at their early age*, yet I do not know how far it might be judicious to recommend the use of it generally among practical farmers, until a more minute scrutiny had been made respecting the expence of labour, fuel and food. Should it be any satisfaction to the Society to obtain a minute detail of those particulars, I shall consider it no trouble to provide them with the most accurate information I can collect, by a personal examination into every circumstance on the spot. I think, however, that there is no one who saw Mr. CURWEN's young cattle last year, (which had been entirely brought up in open sheds, never depastured,) but must have received a most favourable impression of the plan, or would withhold from him his due meed of praise.

I have the honour to be, Sir,

Your obedient Servant,

G. SCOTT ELLIOT.

Woodslee, Longtown, 8th April, 1816.

To C. TAYLOR, M. D. Sec.

SIR,

SIR,

I HAVE been much from home lately, otherwise your letter of the 30th ult. should not have remained so long unanswered; nor am I at present able to give you a full answer to all the particulars your very proper enquiries extend to.

I was only at Workington during the Agricultural Meeting, when my attention was so much divided, that I had not an opportunity of entering so minutely into the investigation of the method of rearing young cattle, in point of œconomy, so that it is at this moment not in my power to say to what probable extent the plan may be extended, nor whether it will, with the expences attending it, be a profitable mode for the farmer to adopt.

Mr. CURWEN's young stock (those of a year old and upwards,) were certainly superior in size and condition to any that I had before seen fed upon steamed chaff, straw, and turnips, excepting particular animals reared regardless of the cost of the food: but Mr. CURWEN grows so many turnips, and maintains so very few sheep in proportion to what has hitherto been the practice of the most successful agriculturist, that I yet doubt that his whole system does not return that remuneration that is obtained where fewer cattle are kept. In coming to this opinion, I have kept in view that nearly the whole of the land occupied by Mr. CURWEN is not adapted for sheep to eat turnips on the spot they are grown upon; but this does not preclude their being led into a by-field, and eat them with great advantage to the land and to the sheep.

I propose being at Workington early in August next, at which time I will particularly examine the detail of the process of feeding from the pail to the time they are sold to

the butcher, when I will again do myself the pleasure of addressing you.

I am Sir,

Your obedient Servant,

L. ELLIS.

Longtown, 13th April, 1816.

To C. TAYLOR, M. D. SEC.

MY DEAR SIR,

I COULD not have fixed on a more appropriate spot to have addressed you and the Society on any agricultural subject.

The stacking turnips is now carried to a great extent, and with the most compleat success. This method admits of more early sowing, and wheat succeeds. The disadvantage of turnips on strong soils is much done away. The stacks are six feet wide, and piled to a point; a spit of earth is turned upon each side, serving the double purpose of a drain and a buttress for the bottom of the stack.

The turnips are topped and tooled at five shillings an acre. Care should be taken to stack the turnips dry. They should be well thatched with straw to within two feet of the ground. Swedes keep in a perfect good state by these means till June ; a great advantage, also, that they come out of the stacks unfrozen. The middle of October is about the time I start to draw the turnips. The tops of the swedes are admirable food. The common turnips are ploughed into the ground.

Burning:

If the surface soil, I should advise turning up the swarf by

by the plough with a *seem* coulter, leaving one bout always. One cross ploughing cuts it into proper pieces for lifting, and saves labour. Lime immediately from the kiln will ignite the sods in twenty-four hours. A covering of sods should first be laid; then place the lime upon them, and cover it about a foot thick, taking care they are not so close packed as to exclude the air. When the sods are fired, care must be taken not to overload the fire. In proportion as ashes are obtained, the burthen to the fire may be increased. The heaps should not be suffered to rise above six or seven feet high, as the labour is increased by the height. The ashes should be raked from the top to extend the circumference of the heap, by which its power of action is increased. When a body of ashes are obtained, a quantity of clay might be burnt on the top of the heap, mixed a little with sods to keep the fire open.

Where clay alone is to be burnt, I apprehend a small portion of coal will be requisite. The main point is not to suffer the fire to be so strong as to vitrify the ashes. It should never be suffered to burst into flame. Constant attention is required; and when the sods are very dry, it must be attended to both day and night. The fresh turning the sods then can seldom be the case.

The quantity of ashes that should be given to an acre for turnips is not clearly ascertained from ten to twenty ton, according to the facility with which they can be procured. I have very good turnips with eight tons; swedes with twenty.

It is an object to burn the ashes in various parts of the field, to reduce the cartage as much as possible, not only in collecting materials, but in carrying out the ashes. A Winchester of lime would ignite about a square yard of sods a foot thick. If

If any farther information be required, I shall be most happy to afford it.

I see great improvements in the last few years here. The mode of making permanent pasture by taking the swarf out in small pieces, and placed on the ground ; one acre of old pasture will do ten acres. It is well rolled, and sown with seeds ; in the second year it forms a pasture, much superior to what can be got from seeds.

Truly your obliged Friend,
J. C. CURWEN.

Holkham, 18th April, 1816.
To C. TAYLOR, M. D. SEC.

I send you GLOVER's letter, which will shew you the astonishing increase of my young cattle. *Lilly* is only fifteen months old.

April.	Calves.	For Cream.	Sold.	Quarts.	Hall.	Dairy.	Daily	Quan- tity. Quarts.
	G.		G.	2	G.	G.	G.	
7	27	1	51	2	2	4	88	2
8	50	1	45	2	2	11	87	2
9	27	1	46	1	2	8	84	1
10	27	1	47		2	7	84	
11	27	1	48	2	2	7	85	2
12	27	1	48	3	2	6	84	
13	52*	1	43		2	8	86	5
	197	7	352		14	51	601	

HONOURED SIR,

I RECEIVED your letter to my great satisfaction. The stock are all in good health ; I weighed the four following yesterday :—the fat cow weighed 130 stone ; the Ayrshire ox eighty-five stone ; Lilly weighed eighty-one stone ; and the

* There were five gallons of milk returned this morning, which will be given to the calves at night,

young

young ox, dropped March 15, 1815, weighed sixty-nine stone. Lilly took the bull on the 5th instant, and the red heifer on the 10th. You will be able to judge of the condition of the remainder of your young cattle, as they are doing equally well. The potatoes will scarcely hold out without reducing the quantity which is consumed. They steam ninety stone per day. I suppose there are about 160 cart-loads; they began planting yesterday. I am taking all the care I can of our turnips, as the spring is so very cold, and grass like to be backward. I answered Dr. Taylor's letter on the 2nd of this month, and I shall be glad to hear that your honour has got the Medal.

You say you left me to settle the milk delivered to the dairy. I told them they were to have it by the gallon, but they thought it was not possible to sell the skim-milk. I wished them to make cheese of the skim-milk, when there was any quantity worth making. Selling the skim-milk, would stop the sale of the other, and I think would not be so profitable. Any milk which is returned I give to the calves; and I hope to have many as good calves as Lilly the next year.

Honoured Sir, I am,

Your obedient humble Servant,

WM. GLOVER.

The skim-milk has been given to the pigs, as it was kept too long to give to the calves.

Workington Hall, April 13th, 1816.

To J. C. CURWEN, Esq. *Ibbetson's Hotel, &c. &c. &c.*

DEAR SIR,

I was induced, at the request of many of my agricultural friends, to weigh some of my young cattle. Inclosed I send you

you the Certificate of their weight. I have no doubt the yearling heifer would weigh 40 stone, and pay me, even now, eighteen guineas; and this without any expensive food. I shall have great pleasure in sending a surloin of the Ayrshire ox for your anniversary dinner, and though but twenty months old, I will venture to say better beef cannot be eat. I inclose a Certificate for the Committee. I may be too sanguine, but I do consider the experiment as the most important I have ever made. By showing a method by which the animal food of the empire may be augmented—one third at no expence, as at two years old I can bring the animal to the same weight it reaches at three, by grazing. I have numerous visitors, and I believe no one goes away doubting the success of the plan. At my next meeting, I shall have breeders of stock from all parts of the kingdom, and, if they do not unanimously confirm my statement, I shall feel myself bound to return the Medal, should I be so fortunate as to obtain one from the Society.

I last year showed my yearlings *against* two-year-olds, and obtained the Society's premium. I wish the Society would depute some Member to attend, and view the stock. If his report shall not confirm every particular that I state, I pledge my honour to repay all the expence of the journey, as I wish this practice to be introduced under the auspices of the Institution. I will, with pleasure, pay one half of the expences of the Member deputed, though I could wish to hold the Medal, if voted me, till he is compleatly satisfied of its being deserved; and, in case I am not entitled to it, I will pay the whole expence, and forego the honour I am so ambitious of. The obligations I owe the Society, would make it highly gratifying to me that they should introduce to the public,

public a practice that may one day or other be of such essential service in augmenting the victual of the empire.

With great respect,
Your obedient humble Servant,
J. C. CURWEN.

I intreat you to press the deputing a Member to view the stock, who will also report as to green crops and soiling stock, so little known in the South. Whatever you undertake on my part I will perform.

CERTIFICATE.

We hereby certify, that a short horned heifer calved at the Schoose Farm on the 7th of January, 1815, was weighed this 20th of January, and proved sixty-eight stone of fourteen pounds, which leaves no doubt, without any forcing food it would reach an hundred stone at two years old: that its food, has been clover, turnips, and straw, with steamed chaff; and scarce any hay. A steer, dropped the 18th of March, 1815, weighed fifty-four stone. The whole of the stock reared this year, thirty-three in number, have been perfectly free from disorder. An Ayrshire steer calved the 21st of July, 1814, weighed the 20th of January, was seventy-four stone, and is quite fit for the butcher.

GEORGE AITKIN,
WM. GLOVER.

January 20th, 1816.

HONOURED SIR,

We hereby confirm the Certificate sent by us to the Society of Arts, dated the 20th of January, 1816, to be correct,

rect, and, that the statement of the several articles mentioned is accurate.

Witness our hands, this 2nd day of April, 1816,

GEORGE AITKIN,

Wm. GLOVER.

To C. TAYLOR, M. D. SEC.

* * * At the anniversary dinner of the Society, held at the Free Masons' Tavern, on Monday, May 27, 1816, a surloin of beef, of the Ayrshire breed, fed according to Mr. CURWEN's plan, was tasted by many of the Members present, who highly approved the flavour of the meat, as well as the beautiful appearance of the joint. The following particulars of Mr. CURWEN's experiment were circulated in the room.

MR. CURWEN'S *Experiment.*

The best breeds of Cattle are slaughtered at three years old, requiring the produce of four acres, being two years depastured, weight from 60 to 70 stone of 14lbs.

Stock reared on the soiling system may be brought to an equal weight at two years old on the produce of two acres.

Cost of Feeding on this Plan.

210 Gallons of new milk.—The first month	£.	s.	d.
one gallon per day, three months two, at		5	5 0
6d. per gallon,	-	-	-
An acre of turnips, calculated at 20 tons,	5	5	0
An acre of clover, producing 20 tons, at 2 cuttings,	10	0	0
	£	20	10 0
			Value

	Brought forward	£20 10 0
Value of calf when dropt,	- - - - -	2 0 0
		<hr/>
		£22 10 0
Carcass 66 stone, at 8s. 6d. sinking offal,	28 1 0	<hr/>
Probable profit	£5 11 0	

Food Consumed.

120 Days, when at milk, suppose one stone of green food per day,	- - - - -	120 stone
606 Days, at eight stone,	- - - - -	4,848
		<hr/>
		4,968
Forty tons of green food,	- - - - -	6,400
		<hr/>
Surplus,	- - - - -	1,432 st.

On a supposition that the calf weighed six stone when dropt, the gain would be 18 ounces per day.—This gives 80 ounces of green food for the production of one animal.

The health of the animals reared in houses by soiling, is superior to those depastured, and the loss infinitely less.—The progress of the animal being never checked, the symmetry will, it is believed, be more perfect.

Schoose Farm, May 21, 1816:

This is to certify, that an Ayrshire ox, fed by J. C. CURWEN, twenty-two months old this day, was slaughtered on the 19th inst., live weight from food, on the 17th, at twelve o'clock at noon, 88 stone, of 14lbs.

On the 19th, having been kept fasting, 83 stone.

1 Forc

		<i>st.</i>	<i>lb.</i>	
1 Fore quarter,	-	12	8	}
2 Ditto,	-	12	11	}
1 Hind do.	-	12	1	}
2 Ditto,	-	12	3	}
				<hr/>
				49 10 carcass.
Loose fat,	-	6	6	}
Hyde,	-	5	7	16 lbs. to the stone.
Back	-	9	2	}
Blood,	-	2	9	32 stone.
Head, feet, legs,	-	8	1	
Kidneys,	-	0	3	
Loss when cut up,	-	-	-	1 4
				<hr/>
				33 4

Witness, W.M. HOORLOS, Land Agent.

GEORGE AITKIN, Butcher.

W.M. GLOVER, Feeder of Stock.

N. B. The Ayrshire are very inferior in early maturity and propensity to fatten, generally speaking, to other breeds.

THE GOLD MEDAL, *the premium offered in Class 1, was this Session adjudged to WILLIAM CONGREVE, Esq. of Aldermaston House, Berks, for planting 447 acres with acorns. The following Communications were received from him.*

SIR,

I BEG leave to transmit a certificate of my having planted four hundred and forty-seven acres of land with acorns, between

between February 1813, and April 1815, and I shall be very happy if the Society of Arts should think these plantations entitled to the premium offered in article I.

The whole of the land lies in this parish, and, with a very trifling exception, is a new inclosed waste, chiefly covered with furze and heath, and is part of the same extensive tract of common on the southern border of this county, in which I made some plantations of larch in the years 1808, 1809, and 1810. For these plantations, the Society did me the honour of presenting me with the Gold Medal, and they were then in a very flourishing state; shortly afterwards, however, I discovered, that though the surface was in general covered with gravel and flints, the substratum was every where clay, and that, in many places, the larch plants were evidently suffering from too great a degree of moisture in the soil.—For this reason, and from having observed that there were large oak trees growing in hedge rows on all sides of the common, where the land appeared to be of no better quality, I determined to plant the remainder with acorns instead of larch; and, I am happy to say, that I have every reason to be satisfied with the plan I have adopted. The acorns were planted by women and children with sticks used in beansetting, one inch deep, and in rows at different distances; but the distance I prefer for the rows is eight feet; the acorns in the rows are from six to twelve inches apart.

The whole of this land is also planted with Scotch firs, four feet square, which flourish extremely well, and which may be cut down when they become so large as to injure the oaks. I have always found in older plantations that the Scotch firs are excellent nurses to the oaks, and at twenty-five or thirty years growth (probably about the time they will begin to injure the oaks), the firs will be of very considerable

derable value, as is clearly proved by Mr. Waistell's very ingenious papers in the twenty-sixth volume of the Society's Transactions. Oak timber of an early age is of very small value; it would therefore be a long time to wait for any return, if there was no fall before the oak came to perfection.

Besides the quantity of land above-mentioned, I have commenced planting with acorns the land formerly planted with larch, which consisted of one hundred and ninety acres, making in the whole six hundred and thirty-seven acres. I was at one time fearful that most of the larch would have died, but they have lately very much recovered, and many of them are now in a healthy state. I have great satisfaction in being able to say, that the plantations of acorns, for which I received the Society's Gold Medal in 1809, are in a thriving state, and have in some places exceeded my most sanguine expectations. I have lately measured some of the oaks, which are twenty feet high.

I have the honour to be, Sir,

Your most obedient servant,

WILLIAM CONGREVE.

Aldermaston House, Berks, Nov. 5, 1815.

To C. TAYLOR, M. D. SEC.

CERTIFICATE.

WE hereby certify, that we have examined the land described in the annexed statement; that the whole was planted with acorns between February, 1813, and the end of April, 1815; that it is not fit for the purposes of husbandry; that

that it is well fenced, the plants in a thriving condition, and that there are more than *one thousand plants* upon an acre.

J. KNIPE, Minister of Aldermaston.

Wm. STEPHENS, }
Wm. HICKMAN, } of Aldermaston.

SIR,

IN answer to your letter of the 9th, I beg leave to inform you, that the expence of planting was so very trifling, that I did not keep any account of it; but I think that the whole expence, including the collecting of the acorns, could not have exceeded five shillings an acre.

I am, Sir,

Your most obedt. humble servant,
WILLIAM CONGREVE.

Aldermaston House, March 12, 1816.

To C. TAYLOR, M. D. SEC.

*The GOLD MEDAL, the Premium offered in Class 14,
was this Session adjudged to MICHAEL MEEK,
Esq. of Sober, near North Allerton, for planting
134 Acres, with 588,763 Forest Trees. The fol-
lowing Communications were received from him on
the Subject.*

SIR,

UNDERSTANDING the Society of Arts, &c. give premiums for the encouragement of planting, I take the liberty of putting into your hands an account of a plantation I made

in the spring 1813, upon a lot of ground which I purchased for that purpose at Great Broughton, near Stokesley, in the county of York, containing 134 acres, 3 roods, 30 perches, (see Certificate No. 1) on which I planted 588,763 trees, of various kinds, as stated by Certificate No. 2. The situation of the ground, owing to its declivity, is quite unfit for agricultural purposes ; it has a north aspect ; the soil is better and deeper, for the most part, than is generally met with where so much declivity is, and in nature seems well adapted to the growth of fern, excepting the lower parts of the bank, where many springs had made their appearance, but which I caused to be made dry by the assistance of open drains. The subsoil here is yellow clay, the rest is upon a porous rock, which in a few places makes its appearance upon the surface. My engagements in life made it my interest to get this plantation out of hand as speedily as possible ; to effect which, I proceeded as follows :—The shape of the ground is that of an oblong, which I caused to be divided by stakes into eight divisions ; having previously made it known in the country, amongst the labouring class, that a great number of workmen were wanted, to perform various kinds of work, such as draining, holeing and planting, &c., I presently had a sufficient number, so as to commence operations. As they came I divided them into companies, and to each gave a division to hole ; which, after draining the wet parts by day, I let, giving ninepence per hundred for such as were for oaks, to be at nine feet distance every way, and sixpence per hundred for the rest, which, with the larger holes for the oaks, were to be at three feet distance from centre to centre, intending to plant 4840 trees upon an acre. It was not long before I had 116 men at work. During the time the holeing was going forward, I had many opportunities

ties of selecting a man from each company of a more upright disposition than the rest, by the manner of executing his agreement, that when I came to the planting part which was done by day, the command of the company he belonged to was given to him, with the addition of some women or boys, to carry plants; the providing of which, and the inspection of the whole, was left to my gardener and myself. The process of planting did not last longer than sixteen days.

The border of the plantation on all sides is full of green firs, a lesser proportion is scattered all over. The whole at this time, I am happy to say, promises to equal my wishes, and exceed my most sanguine expectations. In some parts of the country, I have heard complaints of plantations in remote places being visited by nightly predators for poles, broom, shafts, &c. To guard against an evil of this kind, I purchased another lot of ground, on which I built a cottage, and in this I settled my woodman; he was one selected from the 116, who seemed to have my interest most at heart. My object in going so much into detail, is to shew somehow how easy it is to execute a work of this kind with perfection and dispatch; and to others, who have planted ten times more than myself, that whatever is worth doing, is always worth doing well.

To the above I cannot add it was performed at a small expence, nor can I omit saying, should the Society for the Encouragement of Arts, &c., (for whose inspection this is intended, with the certificates herewith), require any further information upon this subject, it will give me pleasure to forward it; and should I be so fortunate as to become a successful candidate for the premium offered for Article 14, it will give me the greatest secondary satisfaction; while my first is, that of always remembering I have caused to be

planted, at different times, upwards of one hundred and forty acres of land, for the purpose of growing English oak.

I have the honour to remain, Sir,

Your most obedient servant,

MICHAEL MEEK..

Late of Sober, now at Knaresborough.

Sober, near North Allerton, 1st Jan. 1816.

To C. TAYLOR, M. D. SEC.

CERTIFICATES.

No. I.

THIS is to certify, that Michael Meek, of Sober, near North Allerton, in the county of York, did purchase of the sole Commissioner for the Inclosure of Great Broughton Common, on the twenty-first day of December, 1812, a certain part of the said common, called Broughton Bank, which is very steep and wholly unadapted for the plough, containing by admeasurement 134 acres, 3 roods, 30 perches; all of which he planted before the first day of April then next ensuing, as I have been informed and believe, the same being first well fenced with good stone walls and quick-set hedges; and I believe that the whole is now in a healthy and thriving condition. Witness my hand, the 29th day of December, 1815,

W.M. POWELL, Solicitor to the said Inclosure.

No. II.

THIS is to certify, that Michael Meek, of Sober, near North Allerton, in the county of York, did plant in an inclosure, called Broughton Bank (containing by admeasurement 134 acres, 3 roods, 30 perches), 588,763 trees, of the different kinds named below, between the 1st day of January, 1813,

1813, and the 1st day of April, 1813, which inclosure was well fenced with good stone walls and quick-set fences, and that the trees are now in a healthy and thriving condition; and also, that the said Michael Meek hath built a dwelling-house for his woodman to reside in adjoining the plantation, for the purpose of preventing any depredations that may be intended thereupon.

Larches - - -	401,430	Brought up	576,825
Oaks - - -	70,835	Spruce firs - - -	1,580
Ashes - - -	40,980	Huntingdonshire	
Sycamores - - -	20,800	Willows - - -	7,800
Scotch firs - - -	30,300	Birches - - -	1,400
Beeches - - -	7,180	Elms (Dutch) - - -	1,000
<u>Alders - - -</u>	<u>5,800</u>	<u>Silver firs - - -</u>	<u>158</u>
	<u>576,825</u>	Total	<u>588,763</u>

JOHN NICHOLSON, Woodman.

JOHN ANDERSON, Nurseryman to the
said Michael Meek.

I HEREBY certify, that I have examined the above-named John Nicholson and John Anderson, and that they have before me testified to the above statement being correct.

GEORGE MARKHAM,
One of his Majesty's Justices of the Peace for the
North Riding of the county of York.

SIR,

In compliance with your request, this is to certify, that I signed the Certificate, No. 2, in the presence of Mr. Markham, of Stokesley, on the 29th of last December; also that Mr. Meek's statement to you, a copy of which I have seen,

is accurate in all its particulars, and also that John Nicholson signed his name at the same time, in my presence, before Mr. Markham.

I am, Sir,

Your humble servant,

JOHN ANDERSON, Nurseryman.

Clendorn, by Steeple, near North Allerton, March 16, 1816.

To C. TAYLOR, M. D. SEC.

SIR,

On the receipt of your first letter, I sent one enclosure to John Anderson, and the other to Mr. William Powell.—Mr. Powell was at York assizes at the time; still I expected, ere this, that he would have replied, and enclosed John Anderson's answer with his own. As there seems a little error in your note to Mr. Powell, of his having certified to the number of trees in the Certificate No. 1, I have recommended him to go into the plantation, and measure exactly the distance from tree to tree, and then to forward you his answer in that manner, from which you will easily find the number upon an acre, and with Mr. Powell's certificate to the number of acres, you will be able to make them agree, I dare say, with the number as stated by John Nicholson and John Anderson, in Certificate No. 2. With regard to the exact number, I had no one employed who had any interest in knowing it, except John Anderson, John Nicholson, and myself. If you wish for more evidence of the distance from tree to tree, I can supply you with plenty, and for more evidence to the number of acres, I refer you to Mr Humphries, of Rippon, Yorkshire, who was sole Commissioner

sioner for the inclosure, and of whom I purchased the land. The address of Mr. Powell is at Stokesley, Yorkshire; ~~as~~ also that of Mr. Markham, the magistrate, before whom John Nicholson and John Anderson testified to the number of trees. In a few days, you may fully expect answers from both Mr. Powell and John Anderson; at the same time, if any thing more is wanted, it will give me pleasure to procure it.

As soon as the society have come to a determination upon the premium, so far as concerns my prospect, and should I be so fortunate as to be the successful candidate, it will particularly oblige me by being informed: and also if my presence will be required in town, and about what time.

I am, Sir,

Your most obedt. humble servant,

MICHAEL MEEK.

Knaresboro', 23d March, 1816.

P. S. The plantation in question is about three miles from Stokesley, and possibly you may have some correspondents in that neighbourhood, who can, if asked, say something about it.

To C. TAYLOR, M. D. SEC.

SIR,

ON my return from the assizes, I find your letter of the 7th instant, which has been forwarded to me by Mr. Michael Meek. On referring to a copy of the certificate, signed by me, under date 29th of December last, I find that same applies only to Mr. Meek, having planted the extent of ground therein mentioned, namely, 134 acres, 3 roods, 30 perches, and not as to the number of trees planted, which fact I was not sufficiently conversant of to certify for. I beg leave, however,

however, to mention, that from my own observation in part, (having a plantation of sixteen acres immediately adjoining,) and from the report of a confidential clerk, whom I have sent expressly for the purpose, that the plants are upon an average not more than three feet asunder; and from this you may be able to estimate the number of plants.

I have the honour to be, Sir,

Your most obedient servant,

WILLIAM POWELL.

Stokesley, 26th March, 1816.

To C. TAYLOR, M. D. SEC.

The SILVER MEDAL, the Premium offered in Class 14, was this Session adjudged to BACHE THORNHILL, Esq. of Stanton, near Bakewell, Derbyshire, for planting 116 Acres with 315,000 Forest Trees, being the second greatest quantity. The following Communications were received from him on the subject.

SIR,

I, BEG to be permitted to claim the Gold Medal (Class 14) offered this year by the Society for the Encouragement of Arts, &c. for having inclosed and planted 116 acres of waste land with 315,000 forest trees, between the 1st of October, 1812, and the 1st of April, 1813.

These plantations are situate about four miles north of Bakewell, on parts of the lately inclosed Common of Stanton, which were found to be unfit (either on account of the barren-

ness

ness of the soil, or the quantity of stones or rocks, with which the surface is covered) for agricultural improvement.

About fifty acres adjoin the newly-made turnpike road between Haddon and Winster, where the soil being tolerably good, and the situation sheltered, oaks and Spanish chesnuts sufficient to make a wood of themselves have been planted, and larches, spruce firs, and birches, mixed with them as nurses. This land being covered with very strong fern, plants of a large size (from three to four feet high) were used, in the hope that they would be able to struggle successfully with this opponent, but it has been found necessary to cut the fern each summer, and a man, with boys under his care, have been employed for this purpose, at an expence of about three shillings per acre. The holes for the plants were made twenty-two inches wide, and about four feet asunder, where the rocks and large stones permitted this distance to be kept. This operation was performed with the mattock, by bargain, in the latter end of the preceding summer, when the poor in the neighbourhood were not full of employment, at an expence of about thirty shillings per acre, and the trees were planted in the winter following, by day labourers, under the direction of the person who had the management of my nurseries.

The other plantation, made the same year, is on a more elevated part of the same common, and, besides being very much exposed to winds and colds, the soil is of a particularly unfavourable nature; being of that sort which produces in its natural state nothing but the shortest ling. On this part I planted larches, mixed with Scotch firs, both sorts very small. The distance between the plants here was only three feet and a half, in order that they might better shelter one another, and the holes were (proportionably to the smaller plants),

plants), smaller than those before mentioned, so that the expence of planting, exclusive of the cost of the plants, was in each situation much the same.

I have the satisfaction to find that these plants have, in defiance of the natural obstacles which the situation presented to my fears, taken firm root, and are in a healthy, growing state, much better than I had expected; whilst on the ground first mentioned, the trees have made a progress equal to any I ever observed in the same short time, where the great expence of trenching had not been incurred.

As an old planter, I may be allowed to take this opportunity to state the great advantage I have always found in keeping my plants one or two years at least in a nursery of my own, instead of using them immediately from a sale nursery. Whenever I have been obliged to use bought plants, without so keeping them, they have generally died. I would also use the same privilege to recommend those who propagate the Spanish chesnut, (which I consider to produce timber at least equally valuable as oak,) to prune these young trees five or six years after they have been planted, as they are very liable to throw out strong shoots from the bottom of the stem near the root, which, if left undisturbed for several years, rob the principal trunk of the chief part of its nourishment, and if at length cut off, are reproduced in greater numbers, in consequence of the inactive vessels having grown too contracted to convey so greatly-increased a quantity of sap to the head.

I have the honour to be, Sir,

Your very obedient humble servant,

BACHE THORNHILL.

Stanton, Bakewell, Derbyshire, 20th December, 1815.

To C. TAYLOR, M. D. SEC

WE

WE do hereby certify, that the plantations referred to in the foregoing statement, are well fenced and secured, and appear generally to be in a healthy growing state.

P. GELL, Hopton, near Wirksworth, Derbyshire.

W.M. BRITTLEBANK, Winster, near Wirksworth,
Derbyshire.

D'EWES COKE, Brookhill, near Alfreton, Derbysh.

SIR,

I BEG to acknowledge the receipt of your letter of the 7th instant, and to state, that I did subscribe my name to a certificate on behalf of Mr. Thornhill, certifying that he had planted 116 acres of waste land with 315,000 forest trees, between the 1st of October, 1812, and the 1st of April, 1813; and that from personal observation, and a knowledge of the lands planted, I do believe Mr. Thornhill's statement to be correct.

I am, Sir,

Your very obedient servant,

Wm. BRITTLEBANK.

Winster, 9th March, 1816.

To C. TAYLOR, M. D. SEC.

SIR,

I CERTAINLY put my signature to a certificate respecting Mr. Thornhill's plantations; and from actual inspection I can state the whole to be perfectly true.

I am, Sir,

Your most obedient servant,

PHILIP GELL.

House of Commons, 14th March, 1816.

The

The GOLD MEDAL, the Premium offered in Class 58, was this Session adjudged to J. G. HALL, Esq. of Mixbury, near Buckingham, for protecting 1,160 Merino Sheep. The following Communications on the Subject were received from him.

SIR,

INCLOSED, herewith, I send you a true account of the management of my sheep, &c. verified by a certificate annexed from Mr. PAINTER, a respectable farmer living in this parish. You will oblige me by laying it before the Society of Arts; and should my attendance be required, a notice will oblige me.

I shall be in town on Friday week, and will do myself the pleasure of calling, should I not hear from you sooner.

Your's truly,

J. G. HALL.

Mixbury, near Buckingham, Feb. 20, 1816:

SIR,

IN transmitting the following statement for the consideration of the Society of Arts, &c. I am actuated by two motives; first, the hope of obtaining the honorary medal, which, should I succeed, will be a tenfold recompence for the trouble I may have in drawing this up; secondly, the satisfaction I shall feel by making known to the public the most advantageous mode of managing sheep, in hopes of rendering a benefit to some farmers and agriculturists, by inducing them to adopt similar management. My farm
consists

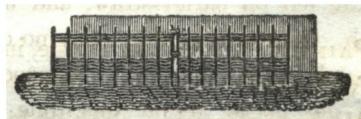
consists of 563 acres, and the number of sheep (all pure Merino) which the farm supports, and have been protected in yards during the winter months, are 1160, viz. ewes 400, and wethers 760. My ewes are divided into flocks, the one protected in a yard sheltered by barns, outbuildings, &c. are fed upon good hay, have always plenty of water, and, as they lamb, I allow them a small portion of brans, a cheap sort of food, very nourishing, and particularly good for the milk. For the other ewe flock, being younger sheep, I erected a temporary yard of furze and straw, in a sheltered corner of the turnip-field, which they are feeding off in the customary way; but so contrived that the sheep may at their pleasure return to the yard, which they do invariably towards evening. I then usually give them a small quantity of hay, where they continue till morning. The two flocks I have been describing amount together to 400, most of which have lambed. The number of lambs lost by severity of the weather, and accidents liable to occur to all animals in a state of pregnancy, are twenty-one; the number of ewes lost since I first adopted the custom of yarding my sheep, amount to eight, which losses must be considered small out of so large a ewe flock. I endeavour as near as possible that my lambs shall come in the month of November, which time I prefer greatly to the spring of the year, for this reason:—In November we have always a great plenty of food (turnips and hay) for our ewes, to enable them to nourish and support their lambs, when on the other hand, in March or April, and indeed sometimes May, it not unfrequently occurs that our turnips and hay are expended before the young grasses are sufficiently forward to allow of sheep depasturing on them; a very great inconvenience, and sometimes of serious consequence to persons having

having a number of ewes dropping their lambs at that season, which we are not liable to at the fall of the year; for it is pretty generally allowed, that ewes with lambs by their sides require more food than at any other period.

The wether sheep are also divided into two flocks, both of which are protected in yards; one a farm-yard, formed by sheds, &c., the other with straw and furze; both of these flocks are fed on barley-straw, and hay only once a day, on which, I am firmly of opinion, no other sheep but the Merino would have continued in as good store order as the whole of my flocks are at this time. Since I first yarded the wethers, the number I have lost is eleven, out of the 760, which loss, I may, I think, again add, will be trifling, it being the general calculation, that large flock-masters loose about one sheep in a score during the winter months, at which rate to estimate my loss out of 1160 sheep, would amount to fifty-eight instead of nineteen, as really is the case. I have next to inform the Society, that owing entirely to yarding my sheep in the manner described (keeping them always well littered, which is of the first importance), I am enabled to manure *eighty acres more land* in the present year, than ever was before done, in one year, on the farm, at the rate of ten good loads to each acre; to this part of my statement, I should wish particularly to draw the attention of the Society, to shew what a surprising advantage arises to the farmer by protecting sheep in yards; for it enables him to make, not only so great an extra quantity of manure, but also that description of manure (sheep dung) the best calculated to improve his land.

Another point to which I again solicit the attention of the Society, is oeconomy in sheep-racks, a valuable consideration

tion where a number of sheep are kept. Five hundred of my present flocks feed out of racks made by myself and shepherd, from the common twig-hurdles, by hammering a portion of the twigs which form the hurdle upwards, but the greater part of them down, leaving a space for the head of the animal to go through; they are placed about two feet from the wall, which forms the yard thus:



They hold hay, and answer every purpose equally as well as the more expensive ones. Another very cheap and useful rack I am in the habit of using, of this kind,



made by a common hedger with the same materials, and according to the same principles that he would work a smooth hedge; they can be made to hold any number of sheep; those for twenty-four sheep, wood and all included, cost two shillings; and are, I am confident, if well made, equally as durable as any other description of sheep-rack; I wish these economical contrivances were generally known to farmers, to whom cheapness, even in the construction of a sheep-rack, is always of importance; but more particularly so in the present alarming and distressing times.

Should the Society consider this account as worthy the premium, No. 58, for which it is presented, it will give

a fresh stimulus to my exertions for the discovery of new and more beneficial improvements in agriculture.

I am, Sir,

Respectfully your's,

J. G. HALL.

Mixbury, near Buckingham, 16th Feb. 1816.

To C. TAYLOR, M. D. Sec.

I, HENRY PAINTER, of Mixbury Lodge, in the county of Oxon, do certify, that this a true account, drawn up by James G. HALL, of Mixbury aforesaid; also that his flocks are in good order, and have been protected in yards, in the way he has described, ever since the commencement of last November.

As witness my hand, this 19th day of February, 1816,

HENRY PAINTER.

DEAR SIR,

IN reply to your queries this morning received, I beg to inform you, first, my course of crops are—*Turnips*; *Barley*, with grass seeds—the grass seeds lay two years; *Wheat*; *Tares*, sown as soon as possible after the wheat is harvested, and fed off with sheep in the spring.

Rye, sown the following autumn, and fed off with sheep in the spring, in time to admit of the land being again sown with turnips.

Secondly, my farm consists of 450 acres arable, one hundred acres of which is sown every spring with grass seeds to remain two years, and about the same quantity of old artificial

tificial grasses is ploughed up in the autumn for wheat. I have also twenty acres of meadow; forty-three acres of pasture; and about fifty acres of saintfoin, which will remain six or seven years.

Thirdly, the soil chalky, upon a poor sort of lime-stone, capable on the average of producing two quarters of wheat per acre, and four quarters of barley.

Fourthly, the quantity of bran used this winter, forty sacks, (six bushels to a sack) at 3s. 6d. per sack, value £7.

Fifthly, I have practised my present custom of protecting sheep since last October, and shall continue it this year till the first of May. Owing to the advantages I have derived this winter from the practice of protecting sheep, I intend to adopt it always in the winter months.

If I possibly can, I will wait on the Committee on Monday evening, but I fear I shall not be able to come to town so soon, but will certainly call on you in the course of next week.

I am, Dear Sir,

Your's truly,

JAMES G. HALL.

Mixbury, March 28, 1816.

To C. TAYLOR, M. D. SEC.

DEAR SIR,

I AM extremely sorry that it is not in my power to attend the Committee, as you mention, on Monday next; but, owing to indisposition, I have not been able to leave the house for these last few days, which would prevent my ac-

ceding to your request ; besides, when I shall, it will be particularly inconvenient to leave home this month, as it is seed-time, and I have no one to assist me in the management of my large farm. I trust the Society, on these grounds, will excuse my personal attendance, and will be able to decide on the merits of my Papers. Inclosed I send you Mr. Henry Painter's reply, and also Mr. Stephen Painter's Certificate, corroborating my statement. Both these gentlemen are large farmers in this parish, the one occupying between four and five hundred acres ; the other about three hundred acres.

If it is not being too troublesome, I shall be greatly obliged by a note, informing me the determination of the Committee relative to my business.

I am, Dear Sir,
Your's truly,

JAMES HALL.

Mixbury, Friday 12th April, 1816.

To C. TAYLOR, M. D. SEC.

SIR,

In consequence of your letter, received this morning, I have to inform you that the certificate you received, confirming Mr. Hall's statement, was signed by me, and I have no doubt as to the correctness of it :—I beg also to add, that I consider his plan for protecting sheep as advantageous in every respect, and particularly as it tends so greatly to increase the quantity of manure.

I am, Sir,
Your obedient Servant,

HENRY PAINTER.

Mixbury, 10th of April, 1816.

To C. TAYLOR, M. D. SEC.

I

I STEPHEN PAINTER, of Mixbury, do certify, that the account of James G. Hall, sent to the Society of Arts, &c. which I have examined, is correct, according to the plan he has adopted for protecting sheep.

STEPHEN PAINTER.

SIR,

In reply to your queries respecting my sheep, I have to inform you, that the number I stated in my address to the Society of Arts, &c. were protected from last October to *this present week*; but from this time till next winter, they will not be housed. My flocks were maintained on turnips and hay, the produce of my farm during the winter, and some brans, as I informed you, were purchased. Last summer they were maintained on the grasses of the farm and other green crops, such as tares, &c., which were considerable. This, I assure you, is true. I have purchased no food of any kind during the year, except the brans mentioned; and, since I last wrote to you, four loads of hay. The farm is 563 statute acres. I hope the Committee will not doubt my statement being correct, as I have, I believe, conformed in every respect to the rules and requests of the Society. I must inform you that I find the extra quantity of manure made will be something considerably more than I stated.

I am, Sir,

Your's truly,

J. G. HALL.

Mixbury, 24th April, 1816.

To C. TAYLOR, M. D. Sec.

M^r. Geo^e. Field's Physeter or Percolator.

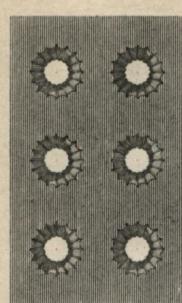
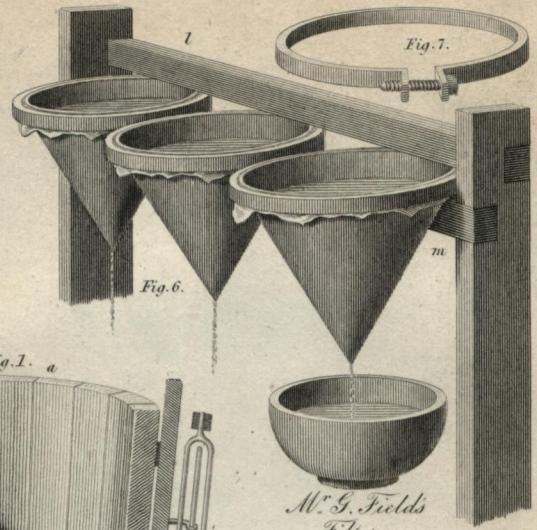


Fig. 8. M^r. G. Field's
Physeter. Fig. 1. a



M^r. G. Field's
Filters.
Fig. 9.

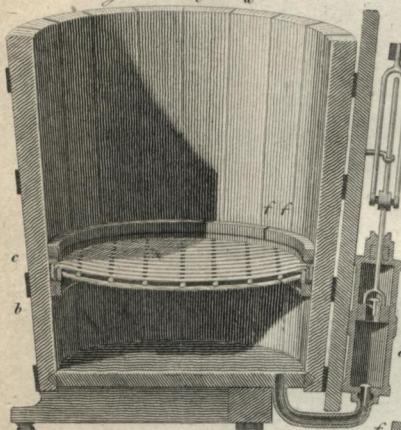


Fig. 3.

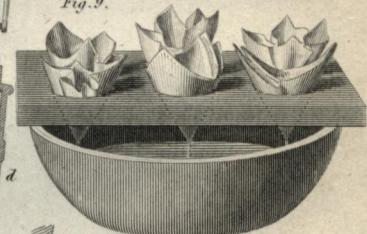
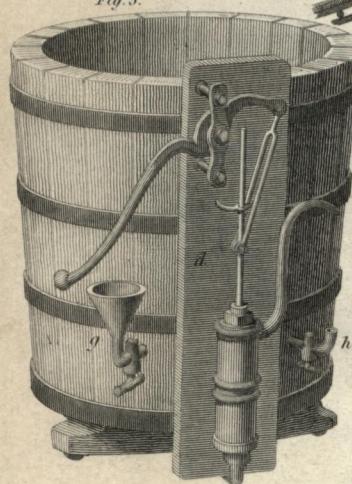


Fig. 4.

Fig. 5.



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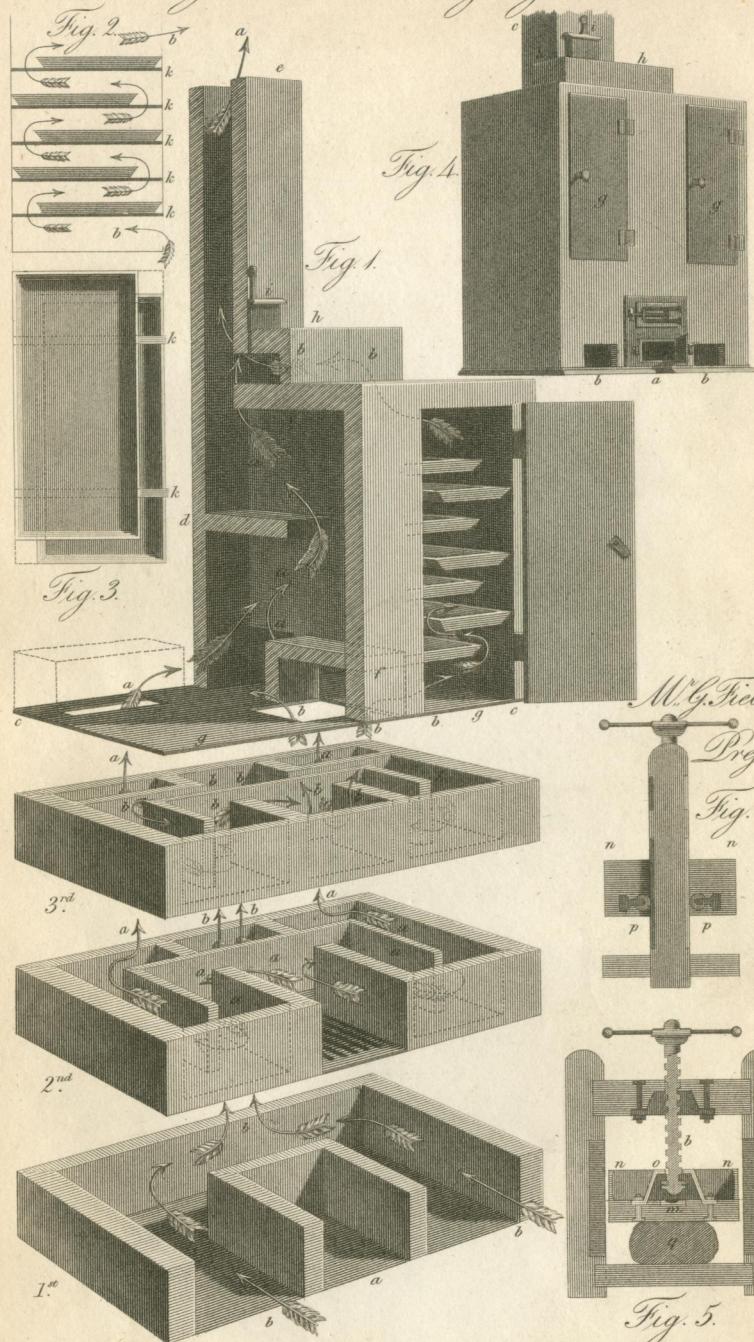


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Fig. 10.

M^r Geo^e. Fields Drying Stove.



Drawn by Cornelius Varley.

Engraved by James Davis.